

NOTES ON SOME DIPTERA FOUND IN ASSOCIATION WITH
TERMITES.

BY GERALD F. HILL, F.E.S.

(Nine Text-figures.)

During investigations into the biology of Termites I have had occasion to open up the galleries of *Mastotermes darwiniensis* Frogg. and *Calotermes irregularis* Frogg. in the trunks of living trees, and in them I have frequently found the larvae and pupae of *Trypanecidae* and *Syrphidae*. As this mode of existence appears to be unusual, I propose to record some observations made in the Northern Territory and North Queensland in this connection and to describe as new one species belonging to the latter family.

In a recent paper (1921) I have referred, *inter alia*, to the habit in *Mastotermes darwiniensis* of entering the trunks of living trees below the surface of the soil, and tunnelling upwards for some distance in the interior before making their appearance in the bark or sapwood. External evidence of such infestation is to be found in the presence of a discoloured watery exudation from cracks in the bark, and, later, in the deposit of an earthy cement-like material, moulded by the Termites to prevent the ingress of light and predaceous animals into the galleries which lie immediately beneath it. On removal of the protecting layer of bark and cement, these galleries are often found to contain a considerable quantity of fluid matter of more or less offensive odour. In or near this fluid I have found, (1) the eggs and larvae of *Rioxa termitoxena* Bezzi, in Coconut palms and Poinciana trees, in Darwin, Northern Territory, (2) the eggs, larvae and pupae of *Psilota* sp., in Poinciana and Mango trees in Darwin, (3) the larvae and pupae of *Psilota cyanea*, n.sp. in Fig trees (*Ficus* sp.) in Townsville, N.Q., and (4) the larvae and pupae of (?) *Microdon* sp., in Mango trees in Darwin. In an earlier paper (1915) I recorded having found the larvae of *Rioxa termitoxena* Bezzi (then undescribed) in the galleries of *Calotermes irregularis* in a living tree of undetermined species.

Family TRYPANEIDAE.

RIOXA TERMITOXENA Bezzi.

An unsuccessful attempt was made to rear the young larvae of *R. termitoxena* in various fruits, and to induce the adults to breed in captivity. Under natural conditions the larvae reach maturity in the galleries of, and in amity with, the termites, then fall to the ground, where they pupate a few inches below the surface. The duration of the pupal stage is from 8 to 11 days. The

flies are occasionally found on foliage, but more often on the sunny side of tree-trunks, upon which they run about actively whilst displaying their wings in constantly changing positions. None of the introduced or indigenous fruits are known to be attacked by this species.

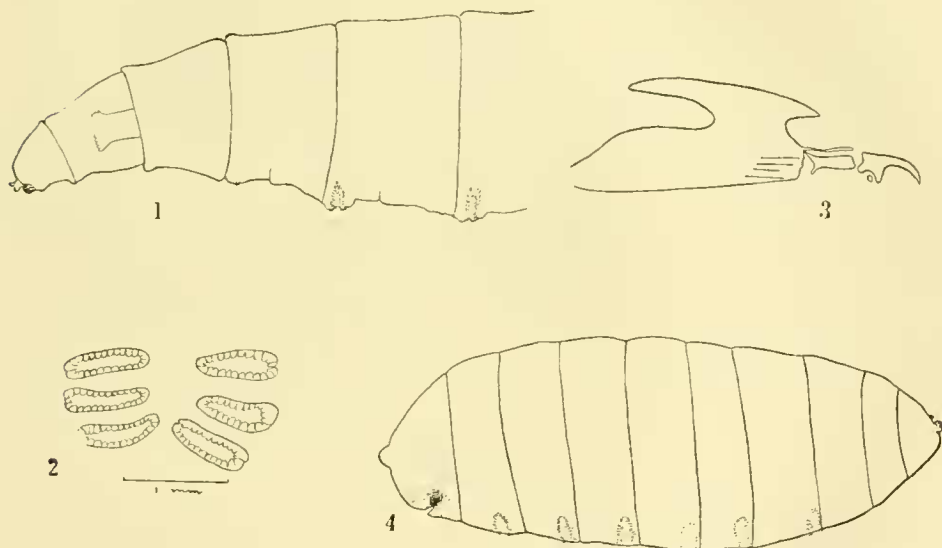
The imago has been fully described by Professor M. Bezzi (1919), to whom specimens were forwarded through the courtesy of Dr. G. A. K. Marshall. The larva and puparium may be briefly described as follows:—

Larva (Figs. 1—3).

Length, 11.0 mm.; width, 2.0 mm.; creamy white, with eleven visible segments; anterior end pointed, posterior end truncate, widest at 5th and 6th segments; anterior spiracles with from 12 to 14 processes.

Puparium (Fig. 4).

Length, 6.5 mm.; width, 2.70 mm.; short, broad; burnt sienna coloured; with 10 visible segments.



Rioxa termitoxena Bezzi.

Fig. 1. Anterior end of mature larva. Fig. 2. Posterior spiracles of mature larva.
Fig. 3. Mandibles of mature larva. Fig. 4. Puparium.

Family SYRPHIDAE.

PSILOTA CYANEA, n.sp. (Figs. 5—9.)

I have noticed this species at only one tree, where the females were observed hovering near matter exuding from a termite-infested trunk or, in one case, ovipositing in a crevice from which the fluid was issuing. Larval development, and sometimes pupation, takes place in the galleries made by the termites; generally, however, the mature larvae leave the shelter of the galleries and

pupate in crevices in the adjacent bark. The duration of the pupal stage is about 12 days.

♂. Length to apex of abdomen, 6.25 mm.; to apex of wings, 8.00 mm.; wings, 8.00 mm.

Colour: Eyes maroon; antennae ochraceous tawny, shading to blackish on the third segment; thorax dusky blue with greenish reflections; abdomen dark bronze green; legs bronze green, basal half of first and second tibiae ochraceous tawny; halteres creamy; wings hyaline, slightly iridescent, veins brown, pterostigma yellow.

Head (Fig. 5) wide (2.70 mm.), wider than thorax; eyes holoptic, finely faceted, clothed with short brown pile (silvery in some lights); clypeus, epistome, and genae blue, not pubescent; rest of front aspect of head densely clothed with silvery pile and dust; antennae (Fig. 7, ♀) porrect, inserted about the middle of the head in profile, first joint about as long as, but narrower than second, both clothed with short, black hairs above, third large, compressed laterally, clothed with minute hairs, arista long, black, three-jointed, first two joints very short, the first shortest, third minutely feathered to the tip.

Thorax wide (2.35 mm.), a little narrower than head, clothed with short black hairs above (silvery in some lights) and more densely with longer hairs on the sides; scutellum large, semicircular behind, posterior margin with narrow upturned edge and fringed with many moderately large black hairs.

Wings (Fig. 8, ♀) without spurious vein, costal border fringed with very short stout black hairs, costal vein terminating at apex of wing at junction of third long vein, squamae moderately large, fringed with long slender pale hairs.

Legs moderately stout, femora of hind legs thickened, bearing a notched process near the apex, apparently similar to the female (Fig. 9). all joints densely clothed with stout black, white or golden hairs, pulvelli large, pale, feathered.

Abdomen wider than thorax, with four visible segments densely clothed with short black hairs (silvery in some lights), hypopygium concealed.

♀. Length to apex of abdomen, 5.25—6.25 mm.; to apex of wings, 7.0—8.25 mm.

Colour similar to male, or with scutellum dark bronze green and abdomen of same colour as thorax; antennae black; legs uniformly dark blue; halteres yellow ochre, frons and clypeus dark bronze green.

Head (Fig. 6): Frons wide at vertex, one-sixth the width of head, widening anteriorly to one-third the width of head at antennae, clothed with fine grey or white hairs, densest anteriorly, face and genae as in male. Ocellar triangle large, prominent; ocelli brown; eyes less pulose than in male, pile silvery.

Thorax as in male, but clothing shorter and scantier, very few long hairs fringing scutellum.

Wings (Fig. 8) as in male.

Legs (Fig. 9) as described in male, except in colour.

Abdomen wider than thorax, with five visible segments; genitalia prominent.

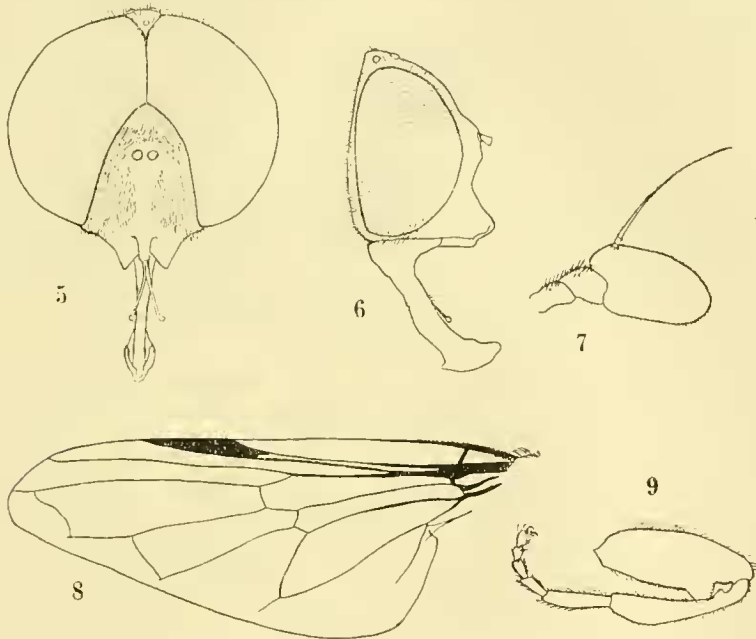
Larva.

Length, 12.0 mm.; width, 3.0 mm.

Colour: Cinnamon brown above, tawny olive below.

The whole upper surface dull, deeply and irregularly ribbed transversely, clothed with very short stout hairs. Head withdrawn into second segment; anterior end truncate in front and fringed with several rows of short stout

hairs; behind the anterior margin seven deep longitudinal furrows, the middle four terminating posteriorly at a prominent transverse ridge; apparently thirteen segments and a prominent cylindrical posterior breathing tube (1.25 mm. long); first visible segment 2.35 mm. wide, second, third and fourth increasing in width posteriorly, fifth and sixth widest; a pair of circular, slightly projecting, spiracular openings on the third visible segment; the three terminal segments much narrower than the preceding ones, the last with prominent lateral expansions. Under surface deeply furrowed like upper surface, the short stout antennae visible within the invaginated anterior end, the first, third, fourth,



Psilota cyanea, n.sp.

Fig. 5. Head of Male. Fig. 6. Head of female. Fig. 7. Antenna of female.
Fig. 8. Wing of female. Fig. 9. Hind leg of female.

fifth, sixth, seventh and eighth segments each with a pair of fleshy pseudopods, pear-shaped, with the pointed ends nearly meeting in the median line.

Puparium.

Length, 9—10 mm.; width, 3.5—4.0 mm.; height, 3.0 mm.

Colour as in larva.

The whole upper surface covered with particles of sand, bark and dried latex. Short and broad, bluntly pointed anteriorly, anterior end sloping down sharply from just before the long, slender, black, anterior spiracles. Posterior end very much narrowed, usually bent upwards or to one side, and terminating in the projecting posterior breathing tube described above. At emergence of the imago, the whole of the anterior end, including the spiracles, is pushed off at a diagonal suture extending from the lower anterior margin backwards around the dorsal surface just behind the spiracles.

Described from one male and two females. Holotype and paratype female in author's collection; allotype in National Museum, Melbourne. Male and female specimens in British Museum.

Locality. Townsville, N. Queensland (April, 1920).

PSILOTA SP.

Of the specimens bred out in the Northern Territory, only one male is available for examination. It differs from *P. cyanea* only in being slightly larger and darker and having antennae, apices of the femora and entire tibiae of the fore and hind legs tawny and the hind tibiae tinged with tawny. As no structural differences have been detected, it is regarded provisionally as a colour variety of the above described species.

I am indebted to Dr. G. A. K. Marshall for kindly examining specimens of *P. cyanea*, and for his opinion that this species has not been described hitherto.

REFERENCES.

- BEZZI, MARIO, 1919.—*Bulletin of Entomological Research*, Vol. x., pt. 1, p. 1.
HILL, G. F., 1915.—Northern Territory *Termitidae*, Part i. Proc. Linn. Soc. N.S. Wales, xl., pt. 1, p. 83.
HILL, G. F., 1921.—The White Ant Pest in Northern Australia. *Commonwealth Inst. Science and Industry*, Bull. 21.
RIDGWAY, R., 1912.—Colour Standards and Nomenclature.